

REMARKS

Reconsideration of the Application respectfully is requested. For the reasons indicated hereafter the Application is urged to be in condition for allowance.

The indication of the allowability of dependent Claims 4, 6 to 8, 11, 12, and 15 to 19 is acknowledged with appreciation. The subject matter of Claim 1 now is restated in new independent Claim 22.

As discussed in detail in Applicant's Specification, a new process is provided for removing alkali metal compounds from organic waste utilizing combustion. In accordance with the process of the present invention combustion is carried out at a temperature of at least 850°C (preferably 900 to 1250°C) under oxidative conditions in the presence of excess air for converting the alkali metal compounds to alkali metal carbonates. The recited process parameters effectively overcome the sticky nature of the formed alkali metal carbonates and effectively deal with their propensity to accumulate and adhere on vessel walls in a deleterious fashion. The flue gases formed during the combustion are cooled by mixing a cooler medium to the flue gases and water or recirculated aqueous solution is poured on the walls of a cooling zone following the combustion. The resulting alkali metal carbonates are dissolved therein and are expeditiously removed. The otherwise sticky nature of the alkali metal carbonates effectively is addressed during such alkali metal compound removal.

The continued rejection of presently solicited Claims 2 to 3, 5, 9, 10, 13, 14, 20 and 22 under 35 U.S.C. § 102(b) over the different teachings of U.S. Patent No. 4,773,918 to Kohl would be inappropriate.

It is apparent from a reading of this cited patent that Kohl contemplates a gasification process which operates under reducing conditions unlike Applicant's specifically claimed process. In such a gasification process that is carried out under reducing conditions a combustible gas is produced which in a subsequent process stage is combusted in order to recover the energy content of the gas. See Col. 5, lines 20 to 29 of U.S. Patent No. 4,773,918. Kohl states that sufficient oxygen must be added to the gasification zone to assure conversion of substantially all of the carbonaceous material in the black liquor to gaseous species such as CO, CO₂, H₂, H₂O, and CH₄. A minor amount of carbon in the black liquor may leave the molten salt as suspended particles of elemental carbon or as sodium carbonate. In the next sentence it is stated "Typically at least 30% of the quantity of oxygen required for complete combustion is required to assure complete gasification". It should be recognized that if the gasification process of Kohl had been carried out under oxidative conditions (i.e., in the presences of excess air), the combustible components CO, H₂, and CH₄ would not be present.

The reducing conditions are further confirmed by the following limitation of Claim 1 of Kohl:

- (e) introducing into said gasification zone an oxygen-containing gas to produce partial combustion and gasification reactions sufficient to maintain the temperature at the upper surface of said bed at a value in the range of from about 870° to 1200°C (1600° to 2200°F), and form a hot combustible gas which rises from said gasification zone, the total amount of oxygen-containing gas introduced into said reactor being less than about 60% of that required for complete combustion of the black liquor; (underlining added).

In the gasification process of Kohl, the organic waste concentrate is concentrated aqueous black liquor produced as a by-product during digestion of wood with aqueous alkaline solutions (*i.e.*, from a chemical pulping process). Black liquor which has been concentrated to a solids content of at least 45 wt %, is introduced into the top of a reactor as a coarse spray. The upper part of the reactor operates as a drying zone and the bottom part of it operates as a gasification zone. In the bottom of the gasification zone a bed of porous solid carbonaceous material (char bed) is formed. Preheated compressed oxygen-containing gas is introduced into the gasification zone towards the bed in order to produce partial combustion and gasification reactions sufficient to maintain a temperature of 870 to 1200°C at the upper surface of the bed, and to form a hot combustible gas, which will rise from the gasification zone. The total amount of the oxygen-containing gas introduced into the gasification zone is less than about 60% of that required for complete combustion of the black liquor. In the process according to the present invention no char bed is used. Combustion is carried out by means of a burner mounted at the top of the combustion chamber positioned above a cooling zone. At the bottom of the cooling zone an aqueous solution of alkali metal carbonate is collected, and the solution is discharged through an outlet opening. As mentioned in the second paragraph at Page 5 of Applicant's Specification, a considerable problem in combusting an organic waste concentrate containing alkali metal compounds under oxidative conditions is that the resulting alkali metal carbonates are very sticky and have a profound tendency to accumulate on the wall of a combustion zone.

In the process of Kohl the hot combustible gas rising through the drying zone of reactor will heat and cause water to be evaporated from the black liquor feed. A moisture containing product gas having a temperature of 350 to 850°C as well as dried black liquor solids are produced with the solids falling onto the surface of the bed at the bottom of the gasification zone. When coming into contact with the hot bed at the bottom of the gasification zone the black liquor solids are converted into the hot combustible gas, which rises from the zone and into alkali metal salts which melt and permeate downwardly through the bed. A stream of product gas is withdrawn from an upper portion of the drying zone and a salt in which the sulfur content is at least about 80% in the form of alkali metal sulfide is withdrawn from the gasification zone further indicating that the combustion has been carried out in reducing conditions, because the major part of the sulfur compounds of the black liquor have been reduced to alkali metal sulfide.

As indicated above, a considerable amount of the alkali metal content in the black liquor is recovered as alkali metal sulfide in the process of Kohl and not as alkali metal carbonate. In the process according to the present invention all sulfur present in the spent liquor is oxidized to sulfur dioxide and sulfur trioxide which sulfur compounds are reacted with limestone and/or burnt lime added to the combustion, whereby non-soluble calcium sulfate and calcium sulfite is produced and removed from the circulation. See in this regard Applicant's Specification at Page 7, line 31 through Page 8, line 7, and Page 10, lines 12 to 20.

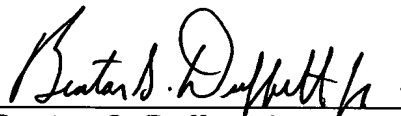
It is well established law that patentability is negated under 35 U.S.C. § 102 only when the prior disclosure is identical to the invention sought to be patented.

Each and every element of the claimed invention must be disclosed in a single reference in complete detail. See Akzo N.V. v. United States ITC, 808 F.2d 1471, 1 U.S.P.Q.2d 1241 (Fed. Cir. 1986); Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F.2d 1101, 231 U.S.P.Q. 185 (Fed. Cir. 1986); Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986); Great Northern Corp. v. Davir Core & Pad Co., 782 F.2d 159, 228 U.S.P.Q. 356 (Fed. Cir. 1986); In re Donohue, 766 F.2d 531, 226 U.S.P.Q. 619 (Fed. Cir. 1985); W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 200 U.S.P.Q. 303 (Fed. Cir. 1983); SSIH Equip. S.A. v. United States ITC, 713 F.2d 746, 218 U.S.P.Q. 678 (Fed. Cir. 1983); and Richardson v. Suzuki Morot Co., 868 F.2d 1226, 9 U.S.P.Q.2d 1913 (Fed. Cir. 1989). The withdrawal of the rejection under 35 U.S.C. § 102 is in order and respectfully is requested.

Respectfully submitted,

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